



MRT news

OCT 2013
VOLUME 2
ISSUE 4

www.mymrt.com.my

newsletter of the MRT project

PP 178111/06/2013 (032659)

Icons of the MRT

STATIONS play a key role in an MRT system. Besides catching trains, stations will be where commuters seek information, purchase tickets or have a cup of coffee before boarding. The design for stations therefore have to achieve the balance between aesthetics and functional efficiency. (Story on page 2)



ATTRACTIVE • Artist impression of an elevated station of the MRT Sungai Buloh-Kajang Line.

inside
this
issue



2

stations inspired
by local architecture
and landmarks

3

bottom-up
or top-down

4

project
updates

6

building young
bumiputera
contractors

8

TBMs hard at work

STATIONS INSPIRED BY LOCAL ARCHITECTURE AND LANDMARKS

by Leong Shen-Li



LANDMARK • Artist impression of the entrance to the KL Sentral MRT Station in front of Muzium Negara.

STATIONS play a key role in an MRT system since they are the first point of contact between a commuter and the train operator.

It is also at stations that commuters will interact with the frontline staff of the MRT system when they seek information or buy tickets.

Mr Keith Allenby, Director of Underground Stations, Mass Rapid Transit Corporation Sdn Bhd (MRT Corp) says stations are designed to give a commuter a convenient and safe journey. "At the same time, stations should also give commuters an aesthetically pleasing experience," he says.

He says one of the challenges in designing for a public transport facility, such as an MRT station, is finding the balance between aesthetics and functional efficiency.

"Designers of a commercial or residential building will always put a lot of emphasis on architecture. This is because architecture plays a very important role in attracting people to these buildings.

"For a railway station, the only reason why a person is in it is to get on or off a train. As such, in relative terms, architectural considerations for a station play a smaller role in attracting a user when compared to a shopping complex or residential building," he says.

This however does not mean that MRT stations have to be drab and soulless buildings which are designed merely to move people into or out of trains as fast as possible. Neither do they need to be totally utilitarian to keep maintenance costs down.

"While providing for functional efficiency, low maintenance and easy asset management, the emphasis should be given for the creation of an architectural identity unique to and worthy of Malaysia's biggest infrastructure project," says Mr Allenby.

The MRT Sungai Buloh-Kajang Line will have 31 stations. Of these, seven will be underground stations while the remaining 24 are elevated stations. MRT Corp, the owner of the project, has adopted separate themes for the designs for the underground and elevated stations.

Mr Allenby says the concept for the design of underground stations of the MRT Sungai Buloh-Kajang Line is inspired by the Klang Gates Quartz Ridge, a pure quartz dyke found in the north-eastern edge of Kuala Lumpur. Quartz, with its multi-faceted quality and colourful reflections, echoes the multi-racial and multi-cultural society of Malaysia, and forms the basis of the concept.



OPEN CONCEPT • Artist impression of the One Utama Station. Based on the wakaf, this design is adopted for all elevated stations.



THEMED • The theme for the Merdeka MRT Station is "Independence" which is reflected in the interior design of the station.

This multi-faceted formation translates architecturally to transparent, angular and folding structures, which forms the overarching design concept for the seven underground stations. At the same time, this overarching concept will be layered with individual station design themes, reflective of the neighbourhood in which each of the stations is located.

"The architectural strategy is to adopt a unifying design concept for the entrance structures throughout all stations while crafting individual themes for the interior to lend a distinctive individual character to each station that is derived from each site's inherent history and context," Mr Allenby says.

Giving examples of the concept, he says the theme for the Merdeka MRT Station – located next to Stadium Merdeka and Stadium Negara – is "Independence," in line with the historical significance of the area. Meanwhile, for the Pasar Rakyat MRT Station, the theme is "Islamic Corporate" to reflect its location in the heart of the future Tun Razak Exchange, Kuala Lumpur's new financial quarter.

For the 24 elevated stations of the MRT Sungai Buloh-Kajang Line, their design is based on the wakaf. A wakaf is a traditional pavilion found in Malaysia built for travellers to stop and rest, making the concept very appropriate for an MRT station.



COMFORTABLE • Artist impression of the platform level of the KL Sentral MRT Station.

The platform levels of elevated MRT stations follow the open-sided design of a wakaf, allowing for natural lighting and ventilation. This not only increases the comfort of commuters who are waiting for trains but also lowers operation costs with reduced air conditioning and lighting.

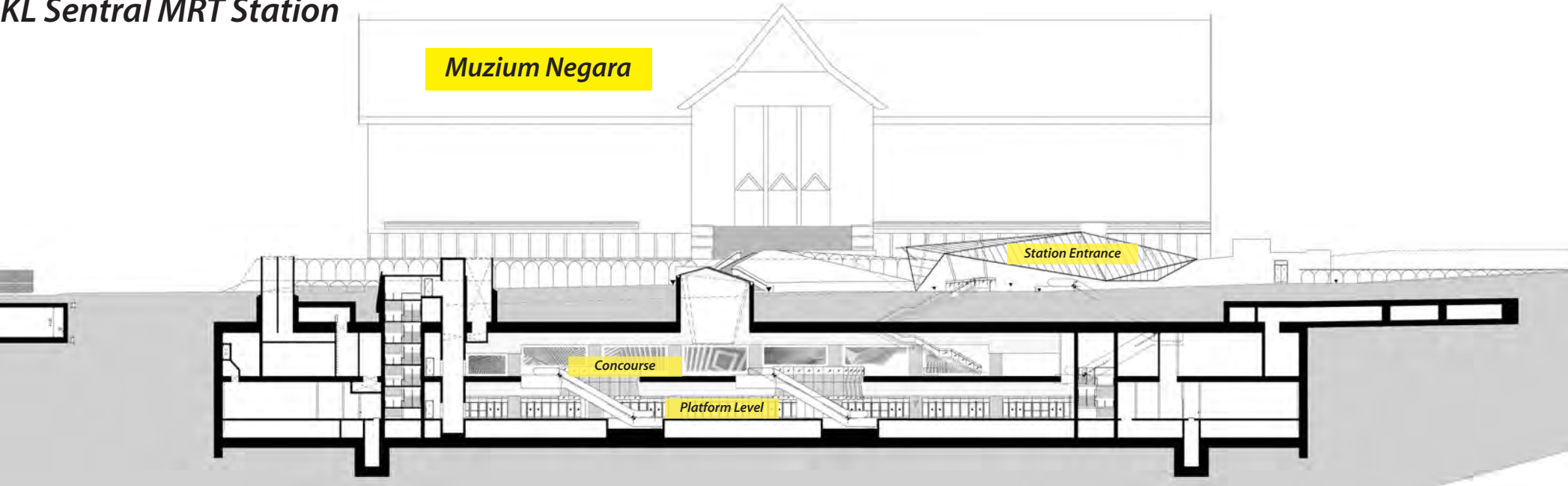
Many of the elevated stations are above roads. This reduces the need to acquire private land for stations.

All stations will have facilities such as escalators, lifts, customer service, ticket vending machines, toilets, prayer rooms, and public telephones. They will also be equipped with facilities for the disabled such as lifts and ramps, tactile guide and warning strips along walkways and platforms.

Stations will also be linked by covered walkways while some underground stations will be connected by underground walkways to adjacent buildings, allowing MRT users to access buildings directly without needing to walk at street level.

Most stations outside Kuala Lumpur's central business district will also be served by feeder buses. Stations will also have adequate lay-bys to enable people to drop off passengers, while covered walkways will be built to allow people to walk to stations comfortably and safely. Sixteen stations will have "park and ride" facilities.

KL Sentral MRT Station





from the desk of the CEO
**DATUK WIRA AZHAR
ABDUL HAMID**

KEEPING THE MOMENTUM

I CAN still remember very clearly the moment in the afternoon of 30 May 2013 when the Prime Minister Dato’ Sri Mohd Najib Tun Abdul Razak launched the first tunnel boring machine (TBM) at our Cochrane Launch Shaft.

I felt a strong sense of excitement and pride as the event marked the start of tunnelling works for the project.

To have been able to start tunnelling two years after the project’s launch in July 2011 is, I believe, a major achievement. We had a multitude of issues that had to be solved and lots of preparatory work had to be done before tunnelling could commence for our first TBM, which we refer to as Cochrane 1.

Choosing and getting the correct TBM was just one issue. We also had to find out as much information about the geological formation that we were going to tunnel through, plan the road diversions for some of the busiest roads in the city, and sort out land issues which, at times, seemed to be our greatest risk.

With the excitement also came a feeling of trepidation. We were starting the most challenging phase of construction of the MRT Sungai Buloh-Kajang Line and we were doing it at the most challenging area in Kuala Lumpur.

The city is home to the Kuala Lumpur Limestone Formation and its Karstic character is said to be one of the most challenging geological formations to tunnel through. Half of our underground alignment will run through this formation.

At the same time, the underground stations which we were going to build were also placed at very busy locations.

Now, five months down the road, I have reason to feel even prouder at the progress we have made.

We now have five TBMs busily excavating tunnels under Kuala Lumpur. Three of them, including Cochrane 1 which was launched by the Prime Minister, are excavating through the Kuala Lumpur Limestone Formation and I am very happy to report that these machines have been performing very well. Another two were launched from the Semantan Portal and are performing equally well.

Cochrane 1 has passed the half-way mark between Cochrane and Pasar Raykat, and as of mid-October, it has tunnelled a distance of 660m. It has successfully gone under Jalan Cochrane, tunnelled beneath the SMART drainage tunnel, and excavated steadily under busy Jalan Kampung Pandan without any impact to the road. It would not be long when this TBM reaches Pasar Rakyat Station, completing the first tunnel stretch of the project.

The two Semantan TBMs have also tunnelled under major roads without any issues. The article on the back page of this newsletter gives you a good summary on our tunnelling works thus far. The very challenging task of building our seven underground stations is also progressing very well, despite the difficult environment in which we have to work. Take our Bukit Bintang MRT Station as an example. The station is located under Jalan Bukit Bintang, which was regularly jammed even before the MRT Project started.

To build the station, we had to come up with a way to maintain the road width so that we will not disrupt traffic flow. Hemmed in between a row of shophouses on one side, and BB Plaza and the Yayasan Selangor Building on the other, you can imagine how difficult it was to come up with a workable traffic management plan.

However, we successfully diverted traffic to create space for us to work, while keeping the same number of traffic lanes. While businesses around the area are feeling the impact of construction work, the owners have told newspapers that the situation is still manageable and they were looking forward to having the Bukit Bintang MRT Station, expected to be one of the busiest, located right at their doorsteps.

Furthermore, you can see from the cover story of this edition of MRT News that we are giving a lot of thought to the design and functionality of our stations.

Good progress has also been achieved for our elevated sections. Even though I travel along the Sprint Highway every day, I am still amazed each time I pass the structures which are coming up for our future Seksyen 16 and Pusat Bandar Damansara Stations. Elsewhere, we already have completed many spans of elevated guideway.

The progress achieved thus far is extremely encouraging. However, we at MRT Corp know that this we are just at the beginning of the journey. There is a lot more that needs doing.

What is important is for work to be carried out at a steady pace. I, as CEO of MRT Corp, certainly intend to ensure that the momentum which we have gained this far is kept going. This is the only way we can ensure that we deliver the MRT Sungai Buloh-Kajang Line to the rakyat in July 2017.

Thank you.

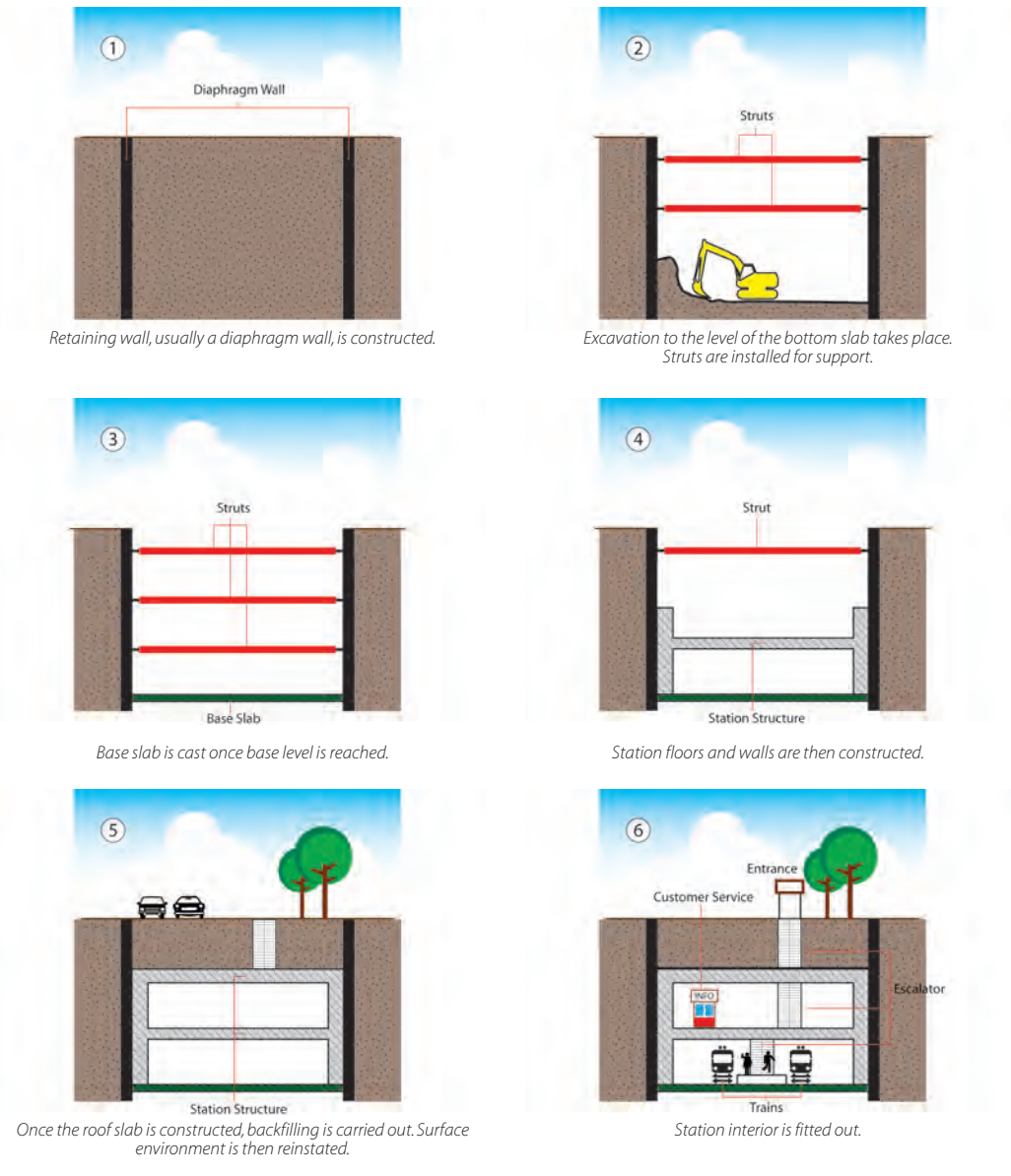
Azhar

BOTTOM-UP OR TOP-DOWN

TWO of the most often heard terms used to describe the construction of an underground station are “Bottom-Up” and “Top-Down”. The following infographics will help shed some light on what the two terms mean.

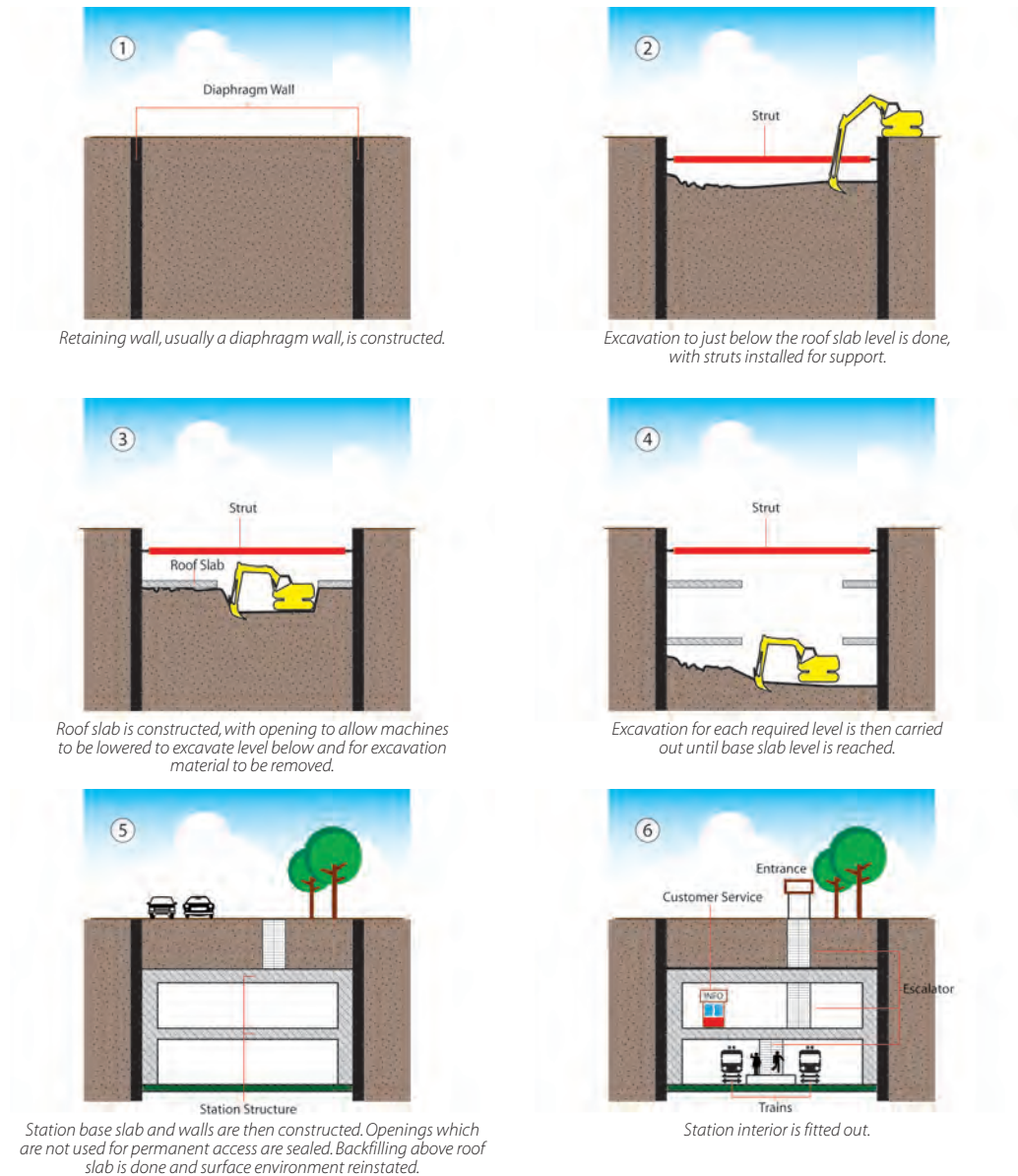
BOTTOM UP CONSTRUCTION

This is the more conventional method of building and is also known as the “cut and cover” method.



TOP DOWN CONSTRUCTION

This method of construction is usually used in densely built-up areas as it has less impact on the environment adjacent to the worksite.



project updates



WORK IN PROGRESS
Construction of the Sungai Buloh Station multistorey park-and-ride building next to the current Sungai Buloh KTM Station in full swing.



COMING UP
Steel structures of the infrastructure building in the Sungai Buloh Depot being constructed.



READY FOR LAUNCH
The launching gantry being erected for the construction of the MRT elevated guideway near Jalan Sungai Buloh-Subang.



COMPLETED
View of a completed MRT guideway span in the Rubber Research Institute of Malaysia.



BUSY WORKSITE
View of construction work taking place on both sides of the Damansara-Puchong Highway in Taman Tun Dr Ismail (left) and Damansara Utama (right).



UPRIGHT
Completed piers along Jalan Damansara at Taman Tun Dr Ismail.



BUSY SITE
View of the Pasar Seni MRT Station worksite.



EXCAVATION WORK
Struts keeping the diaphragm walls of the Merdeka MRT Station box apart as excavation of the station box continues.



FUTURE LAUNCH SITE
View of the Pudu Launch Shaft where two tunnel boring machines will be launched. The closure of Jalan Bukit Bintang (to the right of the hoarded worksite) is not related to the MRT Project.



GOOD PROGRESS
View of the Bukit Bintang MRT Station site where excavation of the station box has begun.



SURFACING POINT
View of the Maluri Portal near the Sri Sabah Flats where the underground tracks will emerge and continue to Kajang as an elevated alignment.



IMPRESSIVE STRUCTURE
View of the launching gantry (blue structure) and the completed MRT guideway near the Sri Sabah Flats.



IN A ROW
Piers at different stages of completion along Jalan Cheras at Taman Midah. This is the location of the future MRT station.



PROGRESS
Three spans of the elevated guideway have been completed while the launching gantry (blue structure) constructs the fourth span near Bandar Tun Hussein Onn.



FULL SWING
Construction of the piers for the MRT guideway and the future Section 16 MRT Station opposite Phileo Damansara in progress.



STRONG
Construction of the retaining wall behind the houses along Jalan Kasah, Medan Damansara, and the new lane for the Sprint Highway, is almost completed.



TWIN TUNNELS
View of the opening of the two tunnels at Semantan Portal. The two protrusions are fans supplying air into the tunnels where excavation works are being carried out.



ROOF COMPLETED
View of the completed roof slab of the KL Sentral MRT Station which is located in front of Muzium Negara (right). The station will be connected via a linkway to the KL Sentral LRT Station.



INSIDE THE SHAFT
The cutter head of the tunnel boring machine being lowered into the Upper Inai Shaft. The front and middle shields were lowered earlier.



DEEP STATION
Excavation of the Pasar Rakyat MRT Station in the future Tun Razak Exchange in progress. The station will be the deepest among the seven underground stations of the MRT Sungai Buloh-Kajang Line.



UNDERGROUND PASSAGE
View of the tunnel from the Cochrane Launch Shaft towards Pasar Rakyat MRT Station.



IN PROGRESS
Excavation of the Maluri MRT Station box being carried out along busy Jalan Cheras.



NEAT
Piers taking shape along the Cheras-Kajang (Grand Saga) Highway at the Sungai Balak Interchange.



HOME AWAY FROM HOME
Cabins in the Kajang Centralised Labour Quarters almost ready to receive workers.



VAST
View of the Kajang Depot site near Kajang. Preparation of the site involved ground raising works and flood prevention measures.



RELOCATION
View of the MRT construction near the Kajang Stadium. A new building is being constructed (front right) to replace the RTM building near the stadium which will be demolished for the MRT tracks.

BUILDING YOUNG BUMIPUTERA CONTRACTORS

by Nadia Azmi

MASS Rapid Transit Corporation Sdn Bhd (MRT Corp) launched the MRT Project Young Graduates Entrepreneurship Programme on 2 September 2013 which is aimed at developing a pool of Bumiputera entrepreneurs in the construction industry.

The programme was conceived by MRT Corp as part of the Bumiputera Agenda for the Klang Valley MRT Project. The programme was developed in collaboration with Perbadanan Usahawan Nasional Bhd (PUNB) and MMC Gamuda KVMRT (PDP) Sdn Bhd, the Project Delivery Partner of the project.

“The programme will provide young graduates with the knowledge and know-how which they will use when they become contractors or subcontractors, whether in Malaysia or abroad,” MRT Corp Chief Executive Officer Datuk Wira Azhar Abdul Hamid said in his speech during the launch.

Also present at the launch was PUNB Chief Executive Officer Encik Dzulkifli Fadzilah, and MRT Corp Director of Stakeholder Relations and Land Management Encik Haris Fadzilah Hassan, who oversees the implementation of MRT Corp’s Bumiputera Agenda.

Twenty graduates were chosen to become participants of the programme.

The graduates had earlier undergone a one-year training stint with PUNB. The training enabled them to gain the necessary skills to become successful entrepreneurs.

The training module also required trainees to form companies which had to be registered with the Construction Industry Development Board (CIDB).

The trainees will undergo training with MMC Gamuda from six months to one year. During the training, the candidates will be assessed and subsequently, their companies will be awarded contracts for the construction of the MRT Sungai Buloh-Kajang Line.

In his speech, Encik Dzulkifli advised the graduates to have patience and a strong commitment to the programme.

“Work hard and demonstrate your capabilities in order to gain MRT Corp’s trust so that you can be part of this mega project,” he said.



WORDS OF WISDOM • Datuk Wira Azhar (second from right) sharing some of his thoughts with the participants of the programme. With him is En Dzulkifli (right).

INDONESIAN DELEGATION VISITS MRT PROJECT

by Nik Haizan Nik Zambri

MASS Rapid Transit Corporation Sdn Bhd (MRT Corp) hosted a delegation from the Coordinating Ministry of Economic Affairs of Indonesia on 5 September 2013. The delegation of 15 personnel was led by Mr Tulus Hutagalung, Assistant Deputy Minister of Transportation Affairs.

The visit started at MRT Corp’s corporate headquarters at Bukit Damansara with a welcome speech from Datuk Wira Azhar Abdul Hamid, Chief Executive Officer of MRT Corp. The guests were then given an overview of the MRT Project Sungai Buloh-Kajang Line by Encik Haris Fadzilah Hassan, Director of Stakeholder Relations and Land Management.

After the briefing session, the delegation was brought to three MRT worksites, led by MRT Corp Project Director Mr Marcus Karakashian.

The first site they visited was that of the future Pusat Bandar Damansara MRT station which is located above the Sprint Highway’s Maarof Interchange. At the site, the delegation saw construction works for the guideway and the elevated station. The site is considered one of the most challenging in the project because of extreme space constraints.

Next, the delegation stopped at the KL Sentral MRT Station worksite. Here, they saw how the underground station was being excavated using the top-down method. With the top-down method the station roof slab is constructed after the diaphragm wall is completed. Excavation of the station then takes place floor by floor downwards. The delegation got the chance to go down into the concourse level of the station which was still being excavated at that time. This level will house the ticketing machines, customer service counters and fare gates in the future.

The last worksite visited was the Semantan Portal site where the delegates got to view the two Earth Pressure Balance Tunnel Boring Machines which are currently excavating towards KL Sentral and Pasar Seni. The visit ended with a lunch in a hotel in Kuala Lumpur. In his short speech before departing, Mr Hutagalung thanked MRT Corp for giving them an insight of the MRT project.

He said the knowledge gained would be useful as Jakarta was also building their first MRT line.



ALL EARS • Mr Hutagalung (third from right) and the rest of the Indonesian delegation listening to Mr Karakashian (left) explain the construction of the KL Sentral MRT Station (right).



INTERESTING • A member of the Indonesian delegation taking a view inside the completed portion of the tunnel between the Semantan Portal and KL Sentral.



TOKEN OF APPRECIATION • Datuk Wira Azhar (right) and Mr Hutagalung exchanging mementos after the visit.



DONATION • Datuk Wira Azhar Abdul Hamid (middle) with the children of Rumah Bakti Nur Syaheera.



GOOD TIME • (From left) MRT Corp staff Tunku Aqilah Alyani Tunku Azim, Norzehan Ali Hassan, Mohd Nazrin Moh Isa, Ahmad Zhafran Zulkifli and Nor Rizah Ismail at the Hari Raya Open House.



FOR THE LESS FORTUNATE • Datuk Wira Azhar Abdul Hamid and Datin Wira Aminah giving 'duit raya' to the children of Rumah Bakti Nur Syaheera.

JOYFUL HARI RAYA AIDIL FITRI

by Alita Suraya Mohd Senawi

A HARI Raya Aidil Fitri Open House was held on 22 August 2013 by Mass Rapid Transit Corporation Sdn Bhd (MRT Corp) at Kelab Golf Negara Subang (KGNS).

The happy event was not only enjoyed by the staff and counterparts of the company, but also shared with 30 under-privileged children from Rumah Bakti Nur Syaheera in Cheras.

MRT Corp Chief Executive Officer Datuk Wira Azhar Abdul Hamid and his wife Datin Wira Aminah handed out duit raya to the children. MRT Corp also donated RM5,000 to the home.

The occasion was attended by around 900 people, comprising the staff of MRT Corp, and guests from the MRT Project’s partners and contractors as well as members of the media. The guests were treated to a large selection of food ranging from local to Western delicacies.

TEMPLE RECONSTRUCTION BEGINS

by Wallace Soh Chun Hwei



LAUNCHED • Senator Dato’ Dr Loga Bala Mohan (fifth from left), Datuk Wira Azhar (fourth from left), Datuk Chew (fifth from right), Encik Kasim (second from right), Ms Lee (third from left) and Mr Ng (third from right) at the ground breaking ceremony.

A GROUND-BREAKING ceremony for Amitabha Temple and Xian Fa Temple was held at the former Kampung Landasan in Cheras on 8 September 2013. The ceremony was officiated by Deputy Minister of Federal Territories Senator Dato’ Dr Loga Bala Mohan a/l Jaganathan. Mass Rapid Transit Corporation Sdn

Bhd (MRT Corp) was represented by its Chief Executive Officer Datuk Wira Azhar Abdul Hamid. The two temples were originally located in Kampung Landasan, a squatter settlement in Cheras 3½ Mile. The squatter settlement had to be

demolished for the construction of the Maluri Portal of the MRT Sungai Buloh-Kajang Line last year. The Maluri Portal is where the MRT tracks will surface from underground and continue southwards to Kajang on an elevated guideway.

The relocation of the squatters and the temples was a multi-agency exercise which was coordinated by the Ministry of Federal Territories. The other parties involved in the exercise were Kuala Lumpur City Hall, Department of Director General of Land and Mines, MRT Corp and MMC Gamuda KVMRT (T) Sdn Bhd, the underground work package contractor for the MRT Sungai Buloh-Kajang Line.

Each household was given a unit of public housing at Kampung Muhibbah in Bukit Jalil in March 2012. After demolition of their buildings in March this year, Amitabha and Xian Fa were temporarily housed in cabins at Kampung Landasan.

The new site for the two temples was formerly occupied by the squatter houses and is located next to the future MRT Maluri Portal. The site is also located beside Sungai Kerayong and SJK (C) Naam Kheung.

The land will now be reserved for non-Islamic houses of worship. Four other Chinese temples which had to be relocated because of other projects not related to the MRT Project will also be rebuilt there.

In his speech, Senator Dato’ Dr Loga Bala Mohan thanked all parties which had contributed to the successful relocation of the temples. He also pledged that the government would strive to preserve all houses of worship, regardless of religions.

Among the others present at the event were Datuk Chew Yin Keen, Chairperson of MCA Bukit Jalil Resort, who assisted in the squatter and temple relocation process, and Encik Kasim Hamzah, Deputy Undersecretary, Policy Planning Division, Ministry of Federal Territories.

Also present were Persatuan Kebajikan dan Perkhidmatan Amitabha Kuala Lumpur dan Selangor chairperson Ms Lee Yut Lan and Persatuan Penganut Dewa Xian Fa Cheras Kuala Lumpur Chairman Mr Ng Yoon Choy.

MANAGING TRAFFIC IN THE CITY CENTRE

by Nadia Azmi

MASS Rapid Transit Corporation Sdn Bhd (MRT Corp) organized a walkabout at Jalan Bukit Bintang for members of the media on 16 July 2013 to show them steps that have been taken to minimise disruption to the traffic flow caused by the MRT Project.

This walkabout was led by Encik Amir Mahmood Razak, Director of Strategic Communications and Public Relations, MRT Corp, and Mr Choo Keng Loong, Bukit Bintang Station Construction Manager, MMC Gamuda KVMRT (T) Sdn Bhd.

The walkabout was held following several media reports of traffic congestion in the area allegedly caused by MRT construction work. There were also reports which claimed that traffic diversions implemented by the MRT Project worsened the traffic situation there.

Encik Amir showed that the traffic management plan implemented for the MRT Project allowed traffic to continue flowing smoothly while construction work was being carried out.

“Complaints of traffic congestion in Jalan Bukit Bintang are nothing new. Even before the MRT construction began, the area suffered from poor traffic flow, especially during peak hours,” explained Encik Amir.



CLARIFYING • Encik Amir Mahmood Razak (left) explaining to reporters the initiatives by MRT Corp in ensuring smooth traffic flow at Jalan Bukit Bintang.

He pointed out that stationary vehicles were illegally parked on both sides of Jalan Bukit Bintang, resulting in the three-lane road being left with a single lane for moving vehicles.

The media were also shown other construction projects not related to the MRT Project taking place along Jalan Bukit Bintang which also had an impact on traffic. One of them was the construction of the Jalan Pudu-Jalan Imbi intersection by Kuala Lumpur City Hall which has resulted in the closure of the Jalan Bukit Bintang-Jalan Pudu intersection.

MRT CORP RAT RACERS

by Nik Haizan Nik Zambri



JUBILANT • MRT Corp's Rat Runners and the cheering team celebrate after completing the race.

MASS Rapid Transit Corporation Sdn Bhd (MRT Corp) participated in this year's Kuala Lumpur Rat Race, the second time in a row. The race, organised by Bursa Malaysia and The Edge, was held on 17 September 2013.

Positioning themselves as public transport “champions”, MRT Corp sent two teams of five members each. The runners in Team 1, who participated in the Open Category, were Muhammad Azam Zakaria, Ahmad Safuan Ahmad Radzi, Fazlan Idris, Zairul Azri Uda Abdul Karim, and

Shanom Nor’ain Abd Khalik. The runners in Team 2, who participated in the Mixed Category, were Ahmad Jepri Mulyanto, Mohd Nazrin Moh Isa, Mohd Hafiz Mohd Ali, Norzehan Ali Hassan and Tunku Aqilah Alyani.

Team 1 finished 36th out of 44 teams while Team 2 was placed 65th out of 66 teams. Muhammad Azam was MRT Corp's fastest runner, completing the 4.5km run in 28 minutes and 45 seconds, followed closely by Ahmad Safuan (28 minutes 47 seconds) and Fazlan Idris (28 minutes 48 seconds).

HAPPENINGS



UPDATES • MMC Gamuda KVMRT (T) Sdn Bhd, Bukit Bintang Station Construction Manager Mr Choo Keng Loong explains to business and property owners of Jalan Bukit Bintang on the construction activities taking place along the road during a lunch organised by the MRT Project underground works package contractor, MMC Gamuda, on 5 September 2013.



FELLOWSHIP • Editors and reporters breaking fast with Mass Rapid Transit Corporation Sdn Bhd staff during a Media Iftar held at One World Hotel on 29 July 2013.



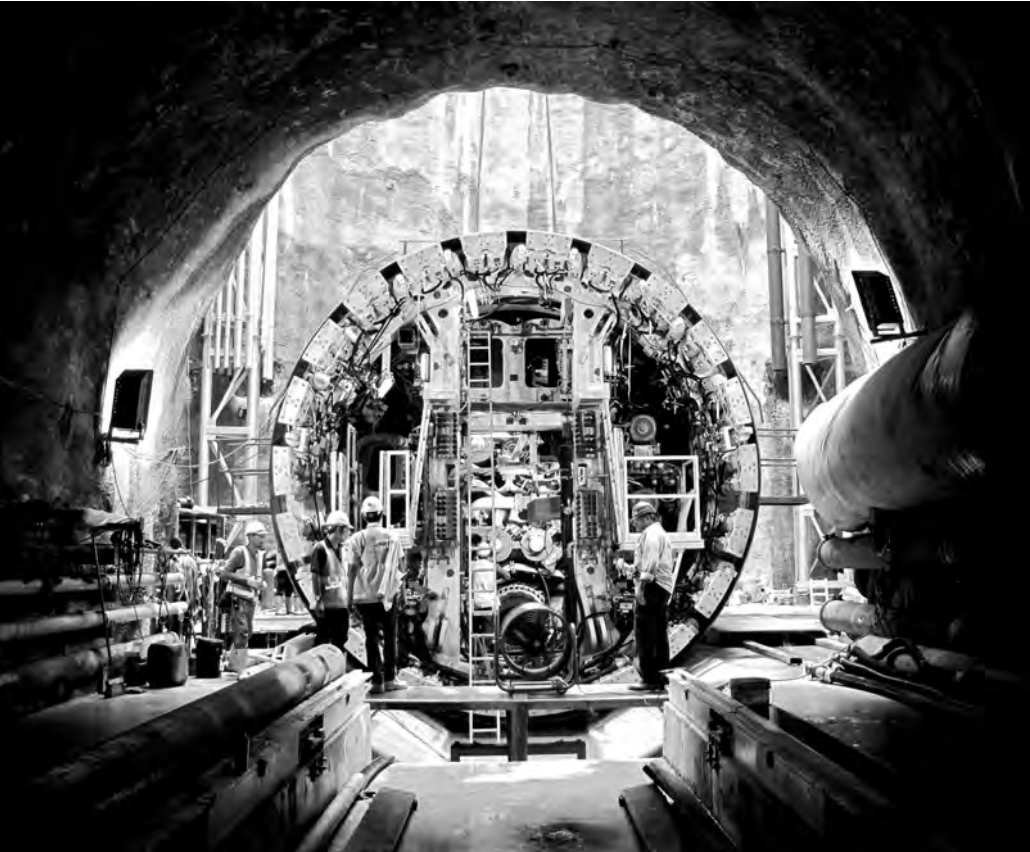
CORPORATE VISITORS • En Amir Mahmood Razak, Director of Strategic Communications and Public Relations of Mass Rapid Transit Corporation Sdn Bhd showing the MRT Sungai Buloh-Kajang Line using the 360 degree Hawkeye application to Bank of Tokyo staff during a visit to the Taman Tun Dr Ismail MRT Information Centre on 19 September 2013.



LEARNING EXPERIENCE • Students from the Faculty of Architecture, Planning and Surveying of University Teknologi Mara Shah Alam together with Mass Rapid Transit Corporation Sdn Bhd and MMC Gamuda KVMRT (PDP) Sdn Bhd staff posing for a photograph after a visit to the Taman Tun Dr Ismail MRT Information Centre on 26 September 2013.

TBM's HARD AT WORK

by Leong Shen-Li



SNUG FIT • View of the front portion of the tunnel boring machine in the Inai Upper Shaft.

TUNNELLING works for the 9.5km underground section of the Klang Valley MRT Project Sungai Buloh-Kajang Line is progressing well. Since the first tunnel boring machine (TBM) was launched by the Prime Minister Dato’ Sri Mohd Najib Tun Abdul Razak at the Cochrane Launch Shaft on 30 May 2013, another four TBMs have been set to work by the MRT Project underground works contractor MMC Gamuda KVMRT (T) Sdn Bhd. A total of 10 TBMs will be used for the project.

The first TBM has been steadily excavating the tunnel in a northwesterly direction towards the Pasar Rakyat Station site. As at mid-October this year, it has tunnelled a distance of 660m, placing it near Jalan Kampung Pandan. The distance between the Cochrane Launch Shaft and Pasar Rakyat Station is about 1km. Being the first TBM to begin tunneling for this project, it is being closely watched by everyone. “This is the first ever Variable Density TBM in the world. Of course it attracted attention,” said Mr Blaise Mark Pearce, Mass Rapid Transit Corporation Sdn Bhd’s Director of Tunnels.

The Variable Density TBM was specially designed to handle tunnelling through the Karstic conditions of the Kuala Lumpur Limestone Formation which lies beneath the eastern part of Kuala Lumpur. This TBM was developed jointly by MMC Gamuda and world-renowned TBM manufacturer Herrenknecht AG.

Another reason why the first TBM, referred to as Cochrane 1, is closely watched is because it has to tunnel beneath two portions of the SMART Tunnel as well as the busy Jalan Tun Razak. Cochrane 1 successfully tunnelled past the drainage tunnel of the SMART in early September without any issue. Cochrane 1 is expected to reach the Pasar Rakyat Station site early December this year.

About one and a half months after the launch of Cochrane 1, another TBM was launched from the same shaft. This second machine, Cochrane 2, is excavating a parallel tunnel about 6m from the first. Like the first, this machine is a Variable Density TBM. As at the middle of October, it has tunnelled a distance of 374m.



TIGHT SPACE • The front portion of the tunnel boring machine is fitted into the gallery of the Inai Upper Shaft.



AT WORK • View of the back of the tunnel boring machine.

Two TBMs have also set off from the Semantan Portal at the northern end of the MRT Sungai Buloh-Kajang Line tunnel. The TBMs – Semantan 1 and Semantan 2 – were launched on 13 June 2013 and 12 July 2013 respectively and are excavating parallel tunnels to the KL Sentral MRT Station in front of Muzium Negara, and then to Pasar Seni MRT Station.

The tunnels for this 2.5km stretch of the underground alignment run beneath Jalan Damansara and Jalan Sultan Hishamuddin.

Semantan 1 and Semantan 2 are Earth Pressure Balance TBMs. These TBMs are used for tunnelling through the Kenny Hill Formation which lies beneath the western part of Kuala Lumpur. The Kenny Hill Formation is made up of sedimentary rocks such as mudstone, shale and sandstone. As at mid-October, Semantan 1 has excavated a distance of about 690m, while Semantan 2 has done about 415m.

The fifth TBM was recently launched on 5 October 2013 at the Cochrane Launch Shaft. It is referred to as Maluri 1 as it will excavate in a southeasterly



PRECISION • Workers positioning a segment to form a tunnel lining ring. The segments are lifted and placed into position by the TBM's segment erector.

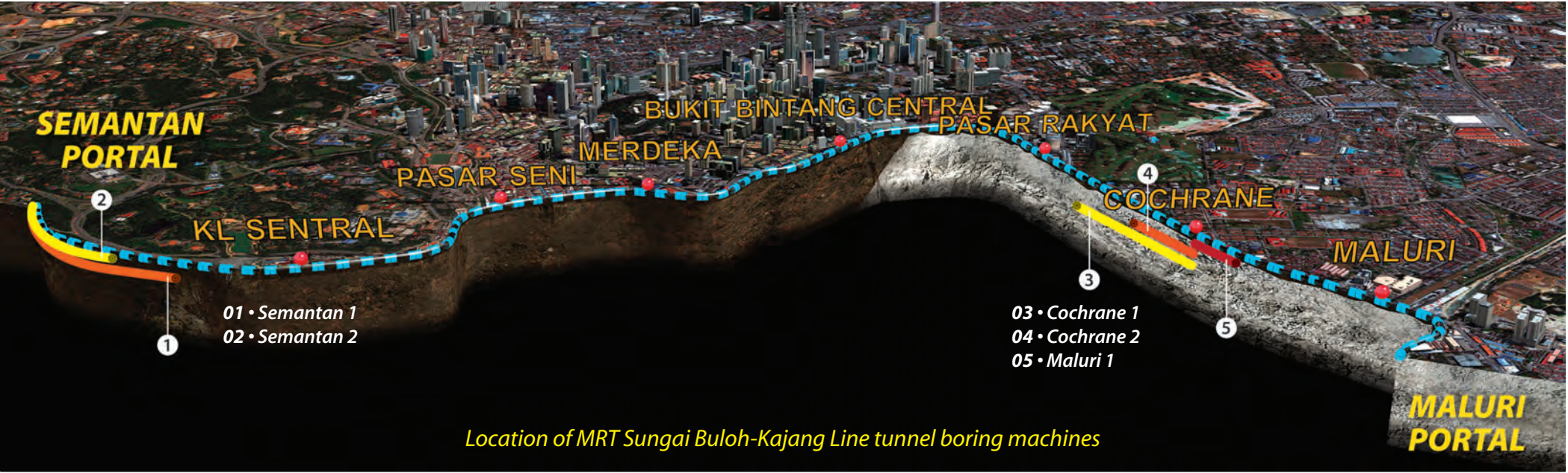


MUSCLE POWER • Workers extending the slurry feed and return lines of a tunnel boring machine inside the tunnel.

direction from the shaft towards Maluri MRT Station and will be retrieved at the Maluri Portal, the southern end of the MRT Sungai Buloh-Kajang Line underground section. As of mid-October, Maluri 1 has completed about 60m. Maluri 2 will soon join this machine and excavate a parallel tunnel from the Cochrane Launch Shaft to Maluri Portal. The sixth TBM for the project, Maluri 2 is currently being assembled and will be launched in November.

Another TBM is currently being assembled inside the Inai Upper Launch Shaft, off Jalan Imbi. This TBM will tunnel from the Inai Shaft towards Bukit Bintang MRT Station.

Mr Pearce said tunnelling works for the project has been proceeding very smoothly. “The TBMs are performing well. Soil settlement has been within expected levels and the TBMs are moving according to the planned alignment,” he said. Three remaining TBMs are currently in storage and will be delivered to their respective launch sites progressively. All tunnel sections are expected to be under construction simultaneously by next year,” he said.



We welcome your enquiries and suggestions.

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